



# *STP Quarterly Review*

24 Jan 2014

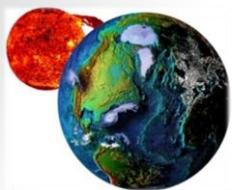
1QFY14



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# OUTLINE

## Solar & Terrestrial Physics Division

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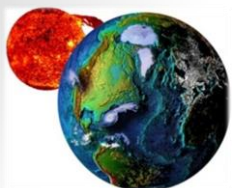
### ➔ STP Division Overview

Milestones & Metrics

Accomplishments & Updates

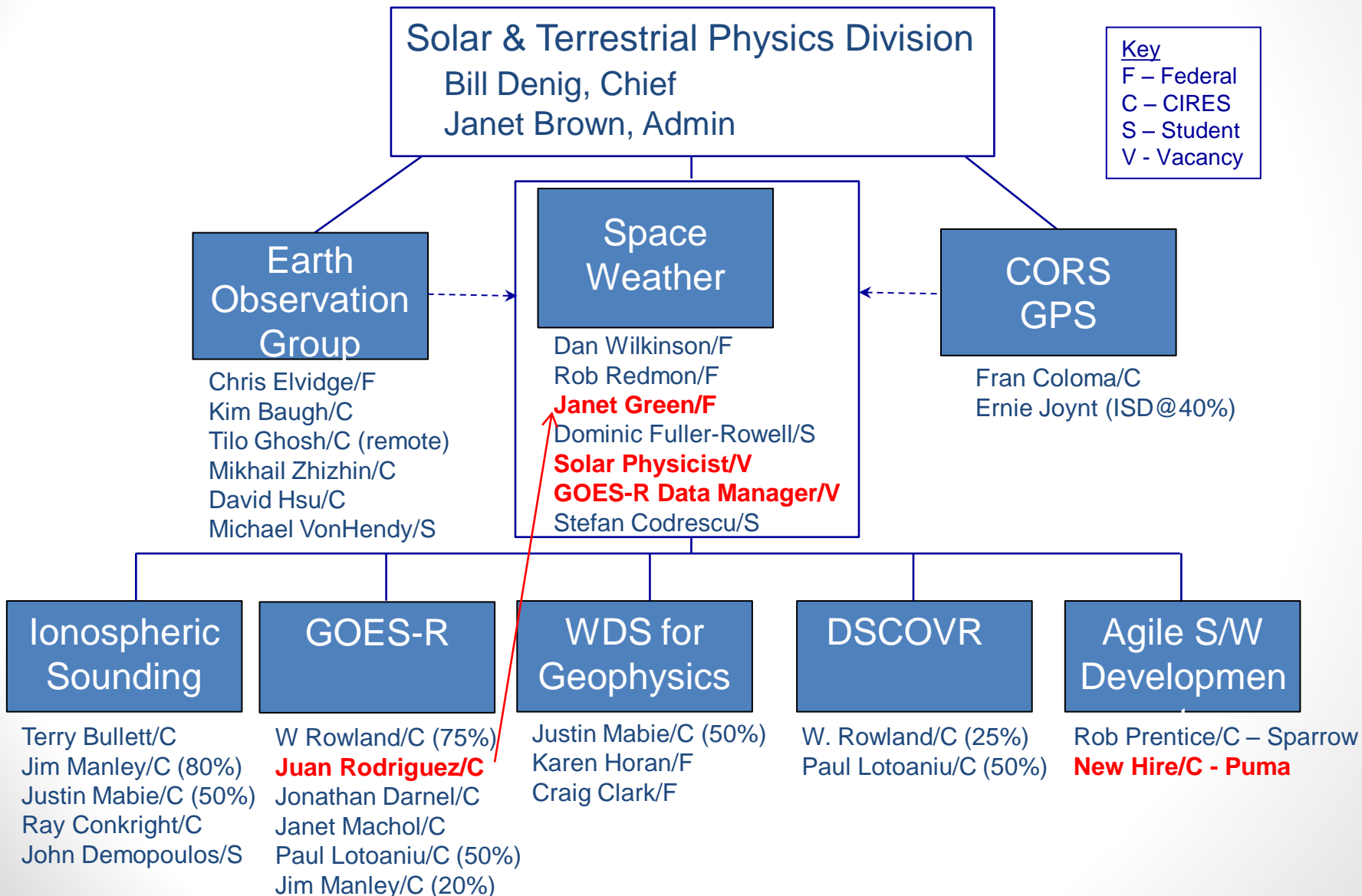
Professional Activities

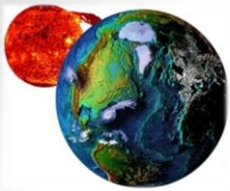
Issues & Summary



# STP Division Overview

## STP Organizational Chart



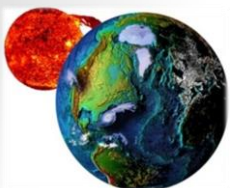


# STP Division Overview

## Featured Baby of the Quarter

Liam Fletcher Rowland was born at 17:17 on 05 Nov 2013. Liam weighed in at 8 lbs, 2oz. Laura and William are the proud parents.





# STP Division Overview

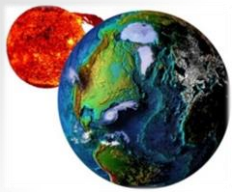
## Site Visits – EOG

Tilo Ghosh is expanding her skillset to remotely process VIIRS data from her home base in India



Alexey Poyda is developing a code base to enable a more timely receipt of VIIRS data from NSOF



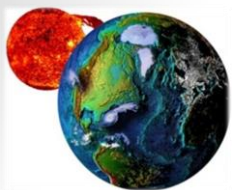


# STP Division Overview

## Hail and Farewell – Joe Kunches

Joe Kunches is retiring from SWPC after more than 35 years of government service. Prior to joining SWPC (SEC) Joe was a NOAA Corp officer supporting SkyLab, a Peace Corp volunteer and a public school teacher. Joe's farewell party immediately follows this review.





# OUTLINE

## Solar & Terrestrial Physics Division

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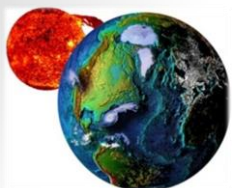
STP Division Overview

➔ Milestones & Metrics

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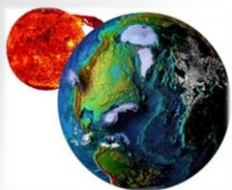
# Milestones and Metrics

## STP FY14 Milestones

Quarter	Milestone	AOP
Q1	Produce Radiation Belt Indices for satellite situational awareness as requested by the Air Force Weather Agency. (Green)	<b>NO</b>
Q2	Ensure required infrastructure is in place to receive, archive and disseminate Deep Space Climate Observatory (DSCOVR) solar-wind data products prior to the DSCOVR launch readiness date. (Denig)	<b>YES</b>
Q2	Return the Ap* geomagnetic index to operations. (Mabie)	<b>NO</b>
Q2	Implement ingest of the NOAA Space Environment Monitor data into the NASA Coordinated Data Analysis web to increase public access to the data. (Green)	<b>NO</b>
Q2	Complete delivery of Level 2+ product Algorithm Theoretical Basis Documents for the Geostationary Operational Environmental Satellite series-R space weather products. (Rowland)	<b>NO</b>
Q3	Deliver to the GOES-R Program Office an initial set of calibration and validation tools for Post-Launch Testing of the space weather sensors on the GOES-R series spacecraft. (Rowland)	<b>NO</b>
Q4	Complete an initial re-design of the Space Physics Interactive Data Resource to enable more efficient processing and enhanced usability. (Zhizhin)	<b>NO</b>
Q4	Recalibrate the NOAA solar irradiance data product from the Extreme Ultraviolet Sensors on the GOES-13, GOES-14 and GOES-15 satellites and provide public access to the data. (Machol)	<b>NO</b>
Q4	Initiate construction of a state-of-the-art ionospheric sounder in the Antarctic for the Korean space weather program. (Bullett)	<b>NO</b>
Q4	Create initial "Cloud-free Composite of Nightlights of the World" product using data from the NOAA Visible Infrared Imaging Radiometer Suite. (Elvidge)	<b>YES</b>

As of 11 Nov 2013

***Request deferring Q2 milestone for L2+ ATBDs to Q3***



# Milestones and Metrics

## Milestone: Radiation Belt Indices (AFWA)

Milestone: Produce Radiation Belt Indices for satellite situational awareness by the Air Force Weather Agency (POC: Janet Green)

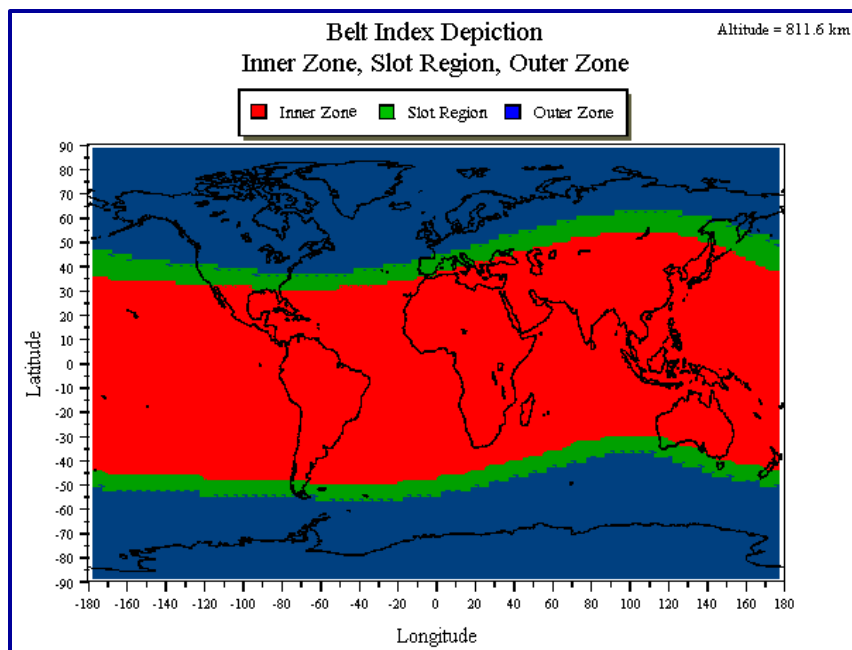
Status: **Completed.** As a part of the POES re-processing NGDC is now producing a set of radiation belt indices. The indices identify times when distinct regions are above or below normal.

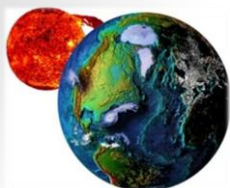
Planned: 1QFY14 (31 Dec 2013)

Actual: 1QFY14 (12 Nov 2013)

Note: *The NOAA availability of these indices will likely be included in Environmental Satellite Data Annex to the MOA on Data Acquisition, Processing & Exchange (DAPE).*

[Link](#)





# Milestones and Metrics

## FY14 Metrics Overview

Space Weather Metric							
Goal	Objective	Performance Measure	POC	1QFY14	2QFY14	3QFY14	4QFY14
Weather-Ready Nation (NWS)	A More Productive and Efficient Economy Through Environmental Information Relevant to Key Sectors of the U.S. Economy	Maintain a greater than 97% (2-sigma, cumulative distribution) of available Space Environment Monitor (SEM) data from the Geostationary Operational Environmental Satellites (GOES) archived on an annual basis	Wilkinson	100%			
Ionosonde							
Goal	Objective	Performance Measure	POC	1QFY14	2QFY14	3QFY14	4QFY14
Weather-Ready Nation (NWS)	Resilient Coastal Communities That Can Adapt To The Impacts Of Hazards And Climate Change	Acquire, process and disseminate >97% (2-sigma, cumulative distribution) of available real-time ionosonde data within 1 hour [TBD] of receipt	Bullett	100%			
Nighttime Lights Metric							
Goal	Objective	Performance Measure	POC	1QFY14	2QFY14	3QFY14	4QFY14
Climate Adaptation and Mitigation (CS)	Improved Scientific Understanding of the Changing Climate System and Its Impacts	Acquire, process and disseminate >97% (2-sigma, cumulative distribution) of available real-time nighttime lights imagery within 3 hours of receipt	Elvidge	100%			
CORS (See Note)							
Goal	Objective	Performance Measure	POC	1QFY14	2QFY14	3QFY14	4QFY14
Resilient Coastal Communities and Economics (NOS)	Resilient Coastal Communities That Can Adapt To The Impacts Of Hazards And Climate Change	Provide a >97% (2-sigma, cumulative distribution) availability for CORS near-real-time data to the NWS Space Weather Prediction Center (SWPC) as per the '4-way' Memorandum of Agreement and subject to normal business-hour response times.	Coloma	100%			
							As of 23 Jan 2014



Greater than 99% (3-sigma) Cumulative Distribution



Greater than 97% (2-sigma) Cumulative Distribution

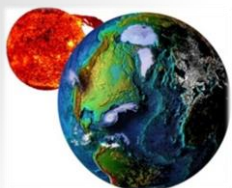


Greater than 84% (1-sigma) Cumulative Distribution



Below 84.1% (1-sigma) Cumulative Distribution

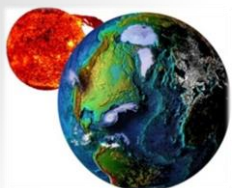
Note: Government Shutdown (01-17 Oct 2013) did not affect metrics.



# STP Division Overview

## Government Shutdown Impacts

STP Product	Data Ingest	User Access	
GOES	Ingest of process GOES data from SWPC was unaffected	No external user access to historical GOES data	
POES	Ingest of unprocessed data from NSOF was unaffected	No external user access available, including AFWA for tool development	
VIIRS	No VIIRS data was available from CLASS - no product generation possible	No ability to provide data and products	
DMSP	Ingest of DMSP data from AFWA was unaffected	DMSP subscription services via http remained available	
DMSP McMurdo	Ingest of McMurdo data ingest from AWA was unaffected	Access to McMurdo data via http remained available in compliance with State Dept/Antarctic Treaty policies	
Space Weather (non NOAA satellite)	Access to procedures for acquiring data impacted - now recovered	No external user access to space weather data	
Mirrior (historical)	Ability to monitor ingest functions impacted - no lost data. No ability to maintain instrumentation.	No external user access to historical ionosonde data was available	
Mirrior (operational)	Ability to monitor ingest functions impacted - no lost data. No ability to maintain instrumentation.	AFWA access to real-time ionosonde data was maintained	
OVATION (operational)	Input data acquired from SWPC was unaffected	No external user access was available including to SWPC for operations	
CORS (historical)	Ingest data not affected	No external access to CORS data via CLASS was available	
CORS (operational)	Ingest data not affected	SWPC/ESRL access OK Emergency response OK	No public access
Lessons learned:			
- Fed-Ex packages received during the shut-down may have been returned to sender as "undeliverable".			
- Provide written directives, including notes of where rules are still uncertain or discrepancies among parties.			
- Preplan for operational user access to NGDC data and products via http.			



# STP Division Overview

## Planned Power Outage Impacts

### STP Impacts – Power Outage – 24-25 January 2014

#### Significant Impacts

- CORS: No GPS data will be available for US-TEC
- POES: Radiation Belt Indices will be unavailable
- Ionosonde: Sounder data will be unavailable
- EOG: No DMSP/VIIRS Products will be available
- **McMurdo: No public access to DMSP data**

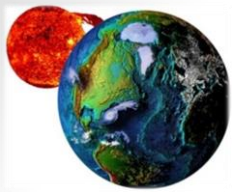
Impacted Party	Notification
SWPC	Yes
AFWA	Yes
AFWA	Yes
Subscribers	Yes
AFWA	Yes

#### Minor Impacts

- NGDC website down
- GOES data ingest will be delayed but recoverable
- OVATION output for SWPC will be unavailable
- GPS-Met (ESRL) can switch to Silver Spring
- ENLIL data ingest will be delayed but recoverable
- DMSP data ingest needs to be coordinated

Impacted Party	Notification
Customers	Yes
SWPC	Yes
SWPC	Yes
ESRL	Yes
SWPC	Yes
AFWA	Yes

**STP recommends proceeding with 24-hour shutdown**



# OUTLINE

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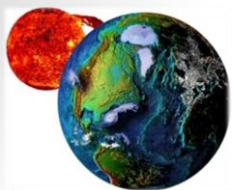
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# Space Weather Team

## Status: GOES-R Status – SME Assessments

**FOUO**

### EXIS

H/W  (G) No Issues

L1b  (G) No Issues

L2+  (G) No Issues

### MAG

H/W  (Y) Less mature design – actual performance may not be as predicted

L1b  (R/Y) Impending waivers will likely result in inferior products

L2+  (G) No Issues

### SEISS

H/W  (Y/G) Hardware waivers will impact overall product performance

L1b  (G) No issues

L2+  (G) No issues

### SUVI

H/W  (G) No issues

L1b  (G) No issues

L2+  (G) No Issues

### Products

L0  (Y) Access to L0 data not fully scoped; archive of L0 products undefined

L1b  (Y) Program will implement updated algorithms as operational prototypes

L2+  (R) No path forward for creating operational L2+ products; no archive plans

### Access

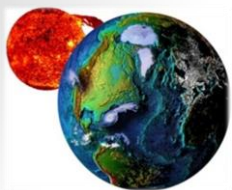
PDA  (G) No issues

GRB  (G) No issues; Likely access to GRB in Boulder; NWS antenna ownership

CLASS  (G) No issues

SPADES  (Y) Awaiting risk reduction decision on SPADES demo – running out of time


**SME assessments do not represent Program views**




# Space Weather Team


## Status: GOES-R Status (Details)

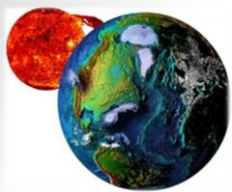
### Detailed Comments<sup>1</sup>:

 **MAG H/W Performance (yellow/green):** Due to the changes in the design, the MAG is not as mature as the other instruments. This means additional issues are likely to be detected in the coming months. Vendor has not yet assembled the calibration data books which will provide a good deal of insight into the instrument's performance.

 **MAG L1b Algorithm (red/yellow):** Program has authorized a prototype of the current version of the vendor's algorithm. If implemented this would repair many of the issues that had already been identified [at which point this status might be Green]. However, the Program is still ardently pursuing substantial performance waivers for the significant degradation of accuracy that would be caused by the "Frozen Baseline" version of the algorithm. If the L1b product only meets the new specs in the waiver, then the utility of the product for the community suffers a significant [Red?] adverse impact. Specific issue is the error associated with the assumptions used for the gradiometer correction algorithm

 **SEISS Hardware Performance (yellow/green):** All four instruments have or are likely to have performance waivers. NGDC is part of the review panel for technical waivers. Hardware waivers have not been sweeping; they have generally been limited to a few energy channels or angles. NGDC provided over 30 pages of detailed written comments on the SEISS calibration data books. The vendor is now in the process of working off these comments and revising the data books accordingly.

 **L0 Products (yellow):** Access to L0 data is planned but not assured. In addition, there are no set plans to archive L0 space weather data and the related housekeeping data. Once the access mechanism is on track then consideration of where to archive these data can be worked.



# Space Weather Team

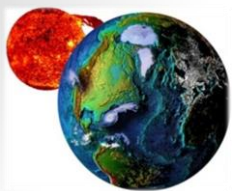
## Status: GOES-R Status (Details)

### Detailed Comments<sup>1</sup> (continued):

**L1b Products (yellow):** After a detailed technical assessment by NGDC of the serious operational impacts of ground processing algorithms coded to the “frozen baseline” the GOES-R program has now decided to authorize a fix of the space weather L1b algorithm codes prior to GOES-R launch as “operational prototypes”.

**L2 Products (red):** Currently there is no path forward for the R2O transition of L2+ products. “Requirements” for the L2+ SWx products were re-validated by the GOREWG. It had been hoped that high-level discussions between NESDIS and NWS would have resulted in a FY16 initiative but this apparently did not happen. Additionally, there are no current plans for the archive of L2+ SWx products.

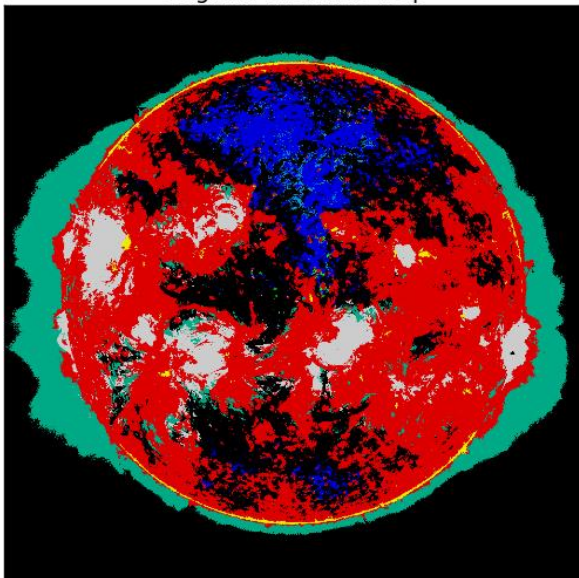
**SPADES (yellow):** A full up implementation of SPADES is dependent on risk reduction funding but the status of the submitted proposal is unknown at this time. In addition to providing a platform to demonstrate L2+ products, SPADES will be used to support GOES-R L1b cal/val and long-term sensor maintenance.



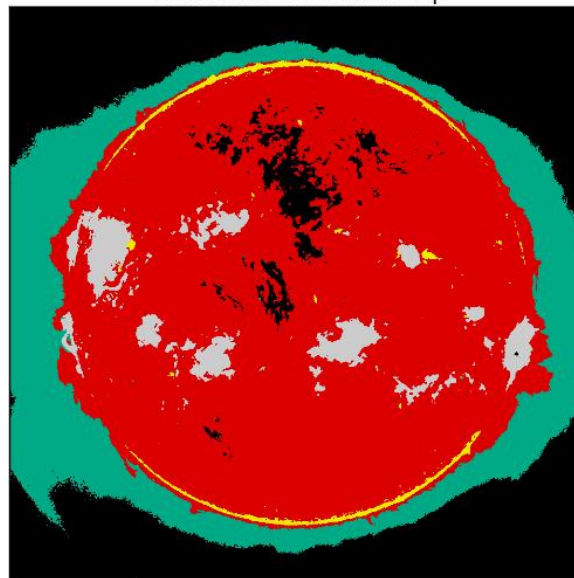
# Space Weather Team

## Report: Impact of SUVI PSF on L2+ Products

Original Thematic Map



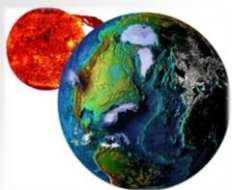
Convolved Thematic Map



The misclassification of solar regions due to the SUVI point spread function (PSF) may have a deleterious impact on user products. Assessments may need to wait until GOES-R SUVI data are available.

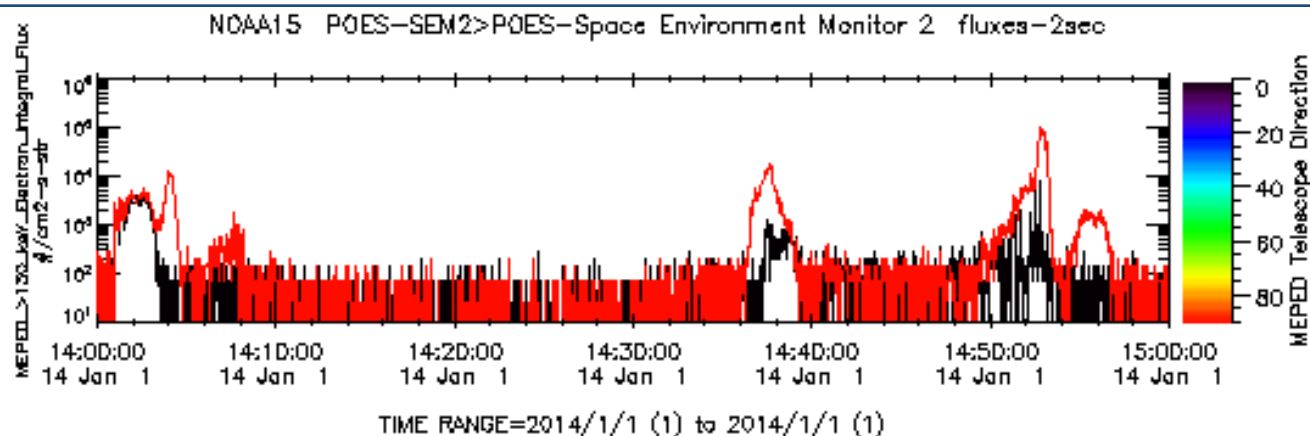
*“You know how when you make a copy of a copy, it's not as sharp as... well... the original.”*





# Space Weather Team

Status: NOAA SWx Datasets Available via CDAWeb



Please acknowledge data provider, NGDC and SWPC at NOAA and CDAWeb when using these data.  
Generated by CDAWeb on Tue Jan 14 10:40:18 2014

*New NOAA datasets will soon be available via CDAWeb*

NOAA15/16/18/19; MetOp-A/MetOp-B

MEPED: e: >40; >130; >287; >612 keV

p: 39; 115; 332; 1105; 2723 keV

TED: e: 50 eV – 1 keV; 1 keV – 20 keV

p: 50 eV – 1 keV; 1 keV – 20 keV

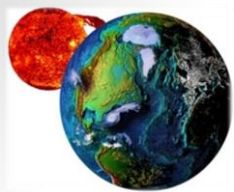
integral energy flux

differential energy flux

channel energy flux

channel energy flux

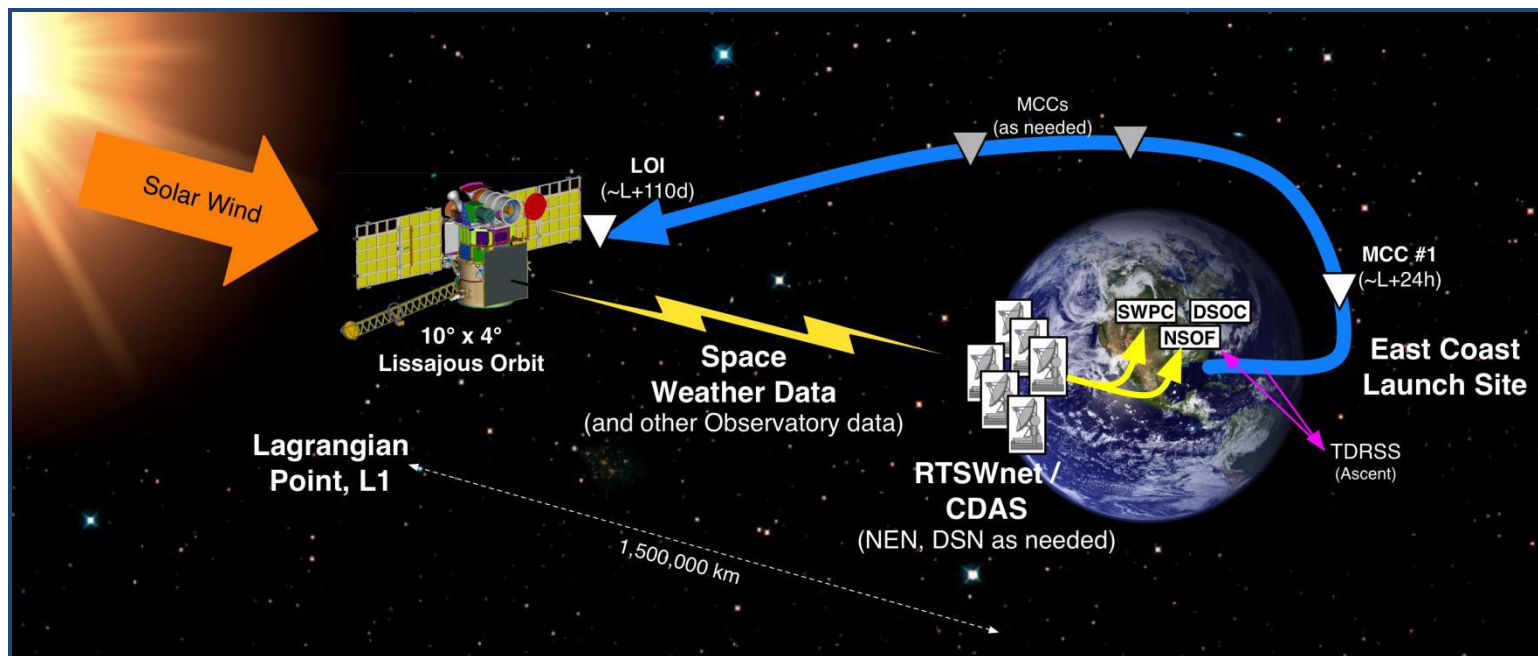
Prototype

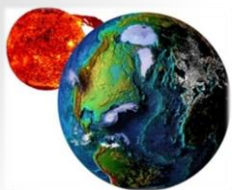


# Space Weather Team

## Accomplishment: DSCOVR Passes MOR Review

DSCOVR has successfully concluded its **Mission Operations Readiness (MOR)** review which occurred at Goddard on 09-10 Jan 2014. The MOR verifies the mission readiness of a flight project and assures that no unresolved problems exist with the flight systems and supporting elements, and that all systems, facilities and teams are ready to support the mission. DSCOVR is a NASA Class D mission that will be launched on a SpaceX Falcon-9 from Cape Canaveral, January 13, 2015.

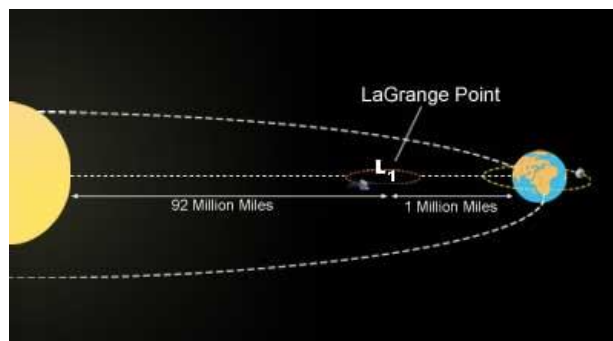




# Space Weather Team

**Status:** Agile Team starts DSCOVR project

The combined Puma-Sparrow agile s/w development team will now tackle the AAA of DSCOVR solar-wind data in anticipation of a 13 January 2015 launch. Lissajous Orbit Insertion (LOI) occurs about 110 days after launch. Effort leverages Common Ingest (CI) and NGDC EXTRACT (NEXT).

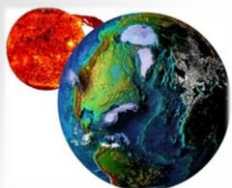


*Note: Starting in FY15 we will need to develop user services to provide improved access to DSCOVR solar wind products.*



## 6 Phases of a Project

1. **Enthusiasm** ← **You Are Here**
2. Disillusionment
3. Panic and Hysteria
4. Search for the Guilty
5. Punishment of the Innocent
6. Praise and glory for the nonparticipants



# Space Weather Team

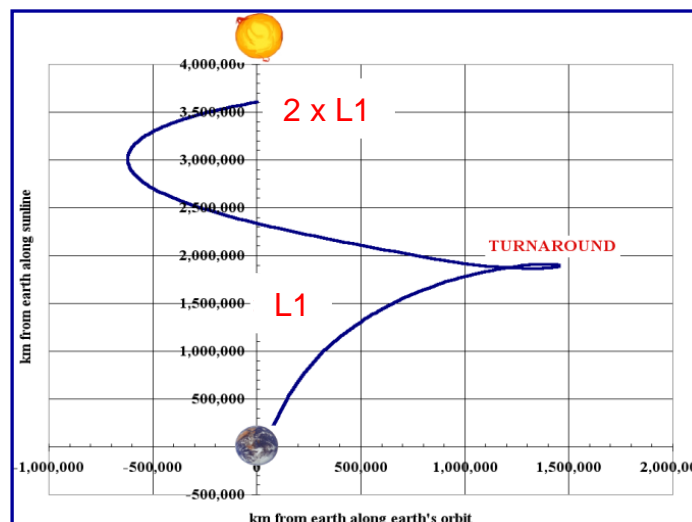
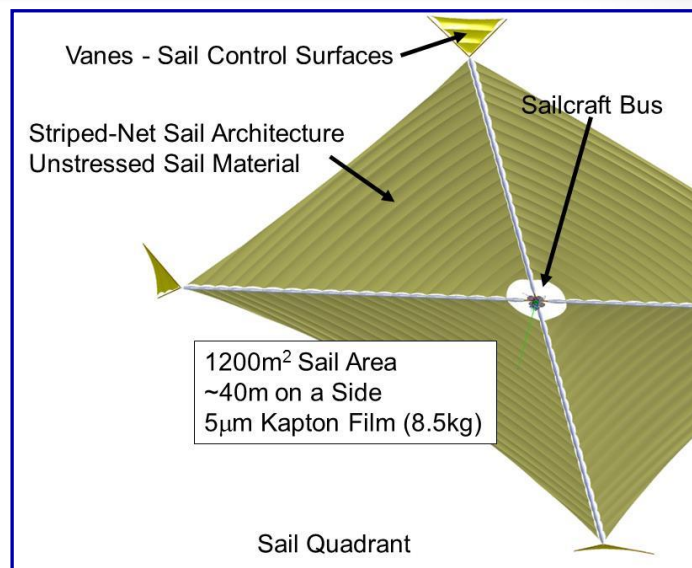
## Status: SUNJAMMER Looking for a Ride

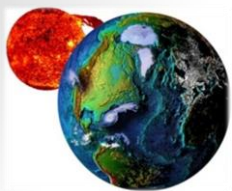


- Sunjammer is a NASA technology demonstration mission (TDM) to examine the propellant-less propulsion potential of solar sails
- Mission will demonstrate sail maneuvers in its first 30 days – then fly to 2 x L1 and then out of the ecliptic plane
- De-manifested from DSCOVR co-launch – Looking for a viable GEO-transfer option
- Space weather instruments:
  - Particle spectrometer – MSSL
  - Magnetometer – Imperial College London
- NGDC responsibilities – Create a web presence and [metadata](#) record. Archive and data stewardship [TBD] – considered part of related DSCOVR support

[Deployment](#)

[Trajectory](#)





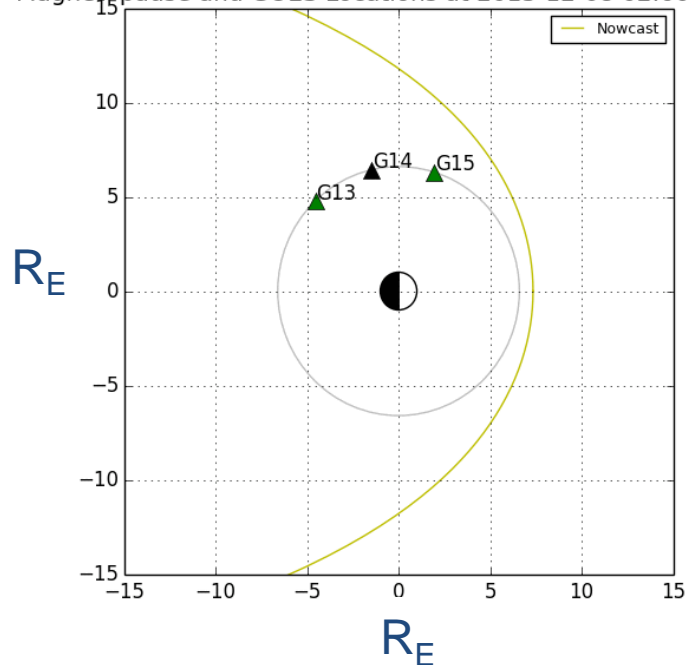
# Space Weather Team

## Demo: Geosynchronous Magnetopause Crossings

December 8, 2013, model predicts magnetopause crosses GEO. No GOES near noon to confirm

### Predicted Crossing

Magnetopause and GOES Locations at 2013-12-08 02:00:00 UTC

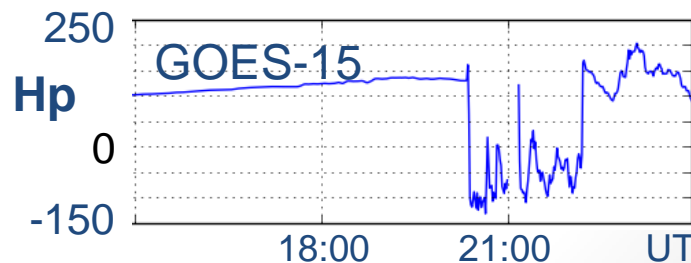
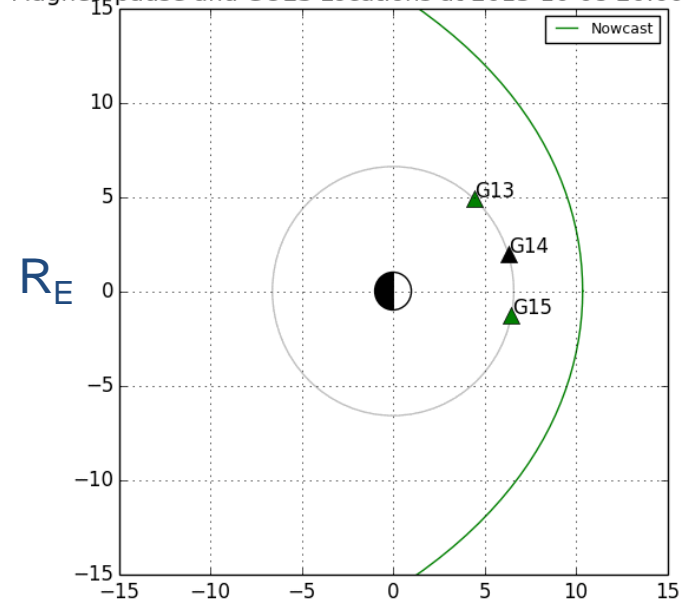


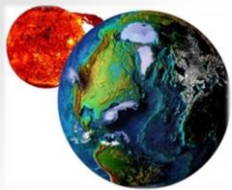
Note: GOES-14 is currently not operational and thus is not providing magnetometer measurements (black triangle)

October 8, 2013, GEO orbit inside magnetosheath. Negative polar field (red triangle) and e-flux dropout observed near noon

### Observed Crossing

Magnetopause and GOES Locations at 2013-10-08 20:00:00 UTC





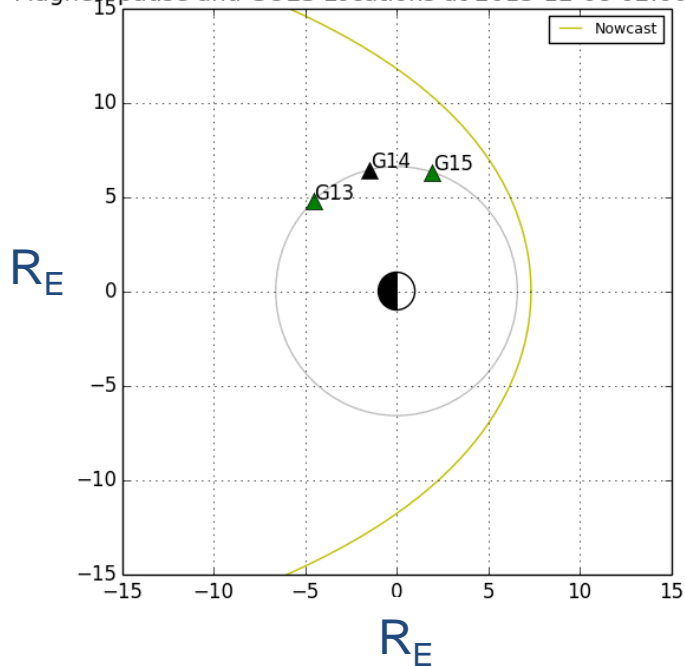
# Space Weather Team

## Geosynchronous Magnetopause Crossings

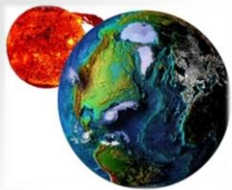
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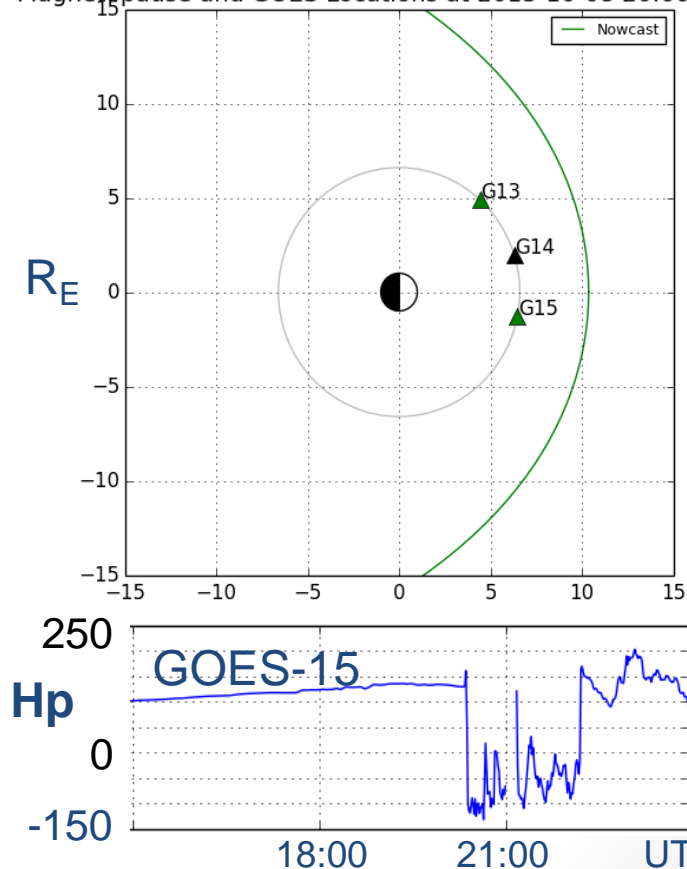
# Space Weather Team

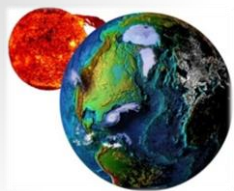
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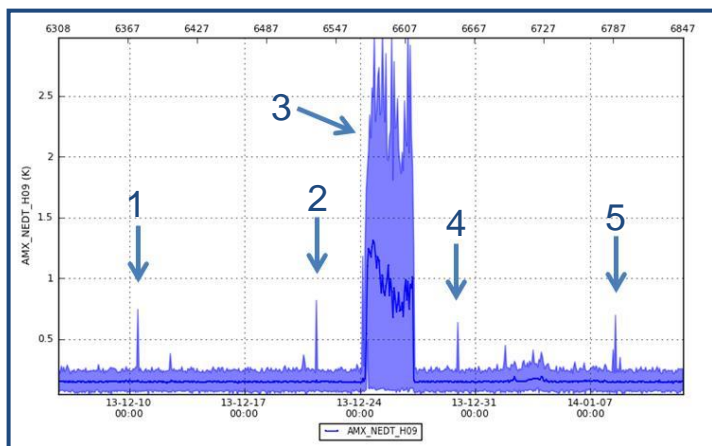




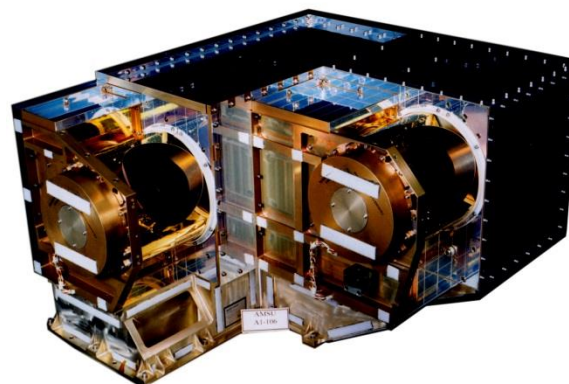
# Space Weather Team

## Accomplishment: MetOp-B Anomaly Assessment

5 AMSU anomaly events occurred on MetOp-B between Dec 2013 until Jan 2014



Advanced Microwave Sounding Unit A1

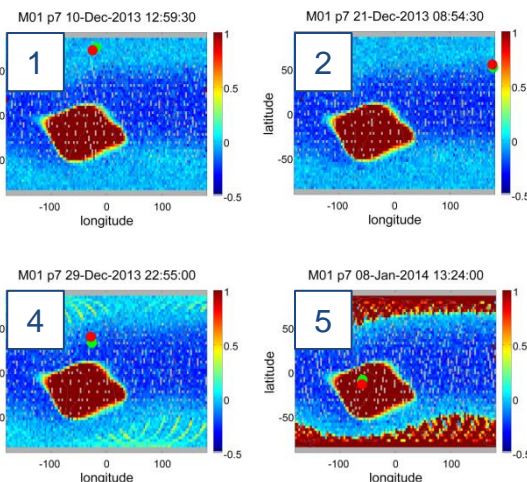


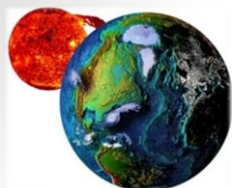
### Conclusion

It is possible that the MetOp-B AMSU anomalies are related to SEU's caused by high energy protons and galactic cosmic rays; however, there is considerable uncertainty to this conclusion:

- One event occurred in a region where an SEU is a low probability
- It is not clear how an SEU could cause a problem that persists for days without further engineering analysis
- Analysis of more events could clarify the cause

Locations overlaid on SEM energetic particle flux data. Green (Red) dot is start (end)





# Space Weather Team

## Attention: REACH Demo – HEALER

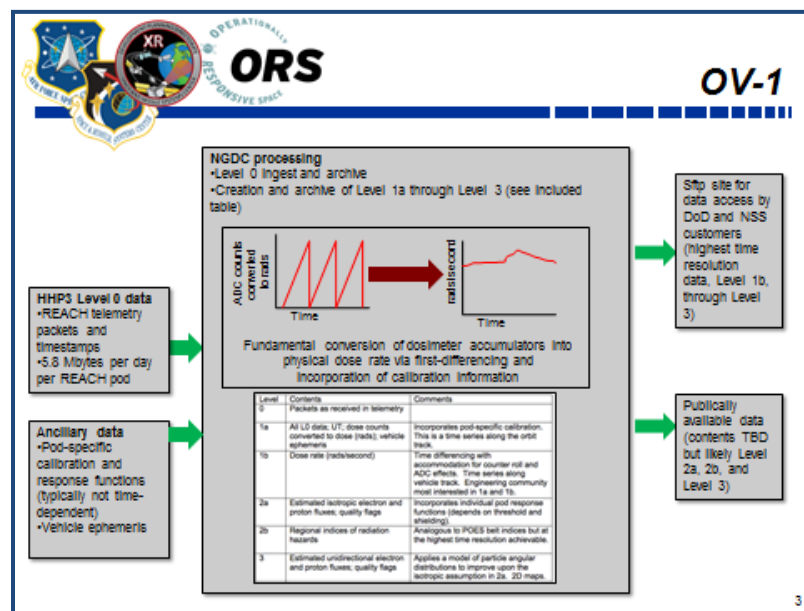
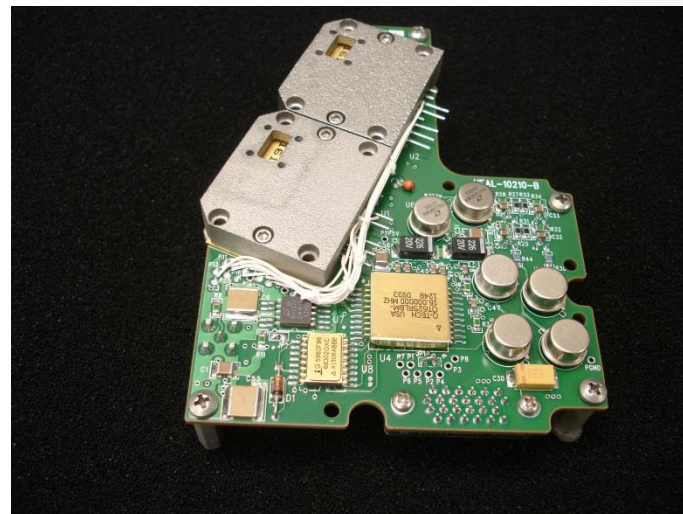
SMC/XR (Aerospace) is planning to fly a series of dosimeters on the Iridium satellite constellation. The USAF is soliciting NOAA participation, specifically NGDC, in the program presumably under the auspices of the DAPC MOA. A coordination meeting (AFWA, FNMOC, NOAA, OFCM) is planned for mid-Feb. OSD (Mulligan) is NOAA lead.

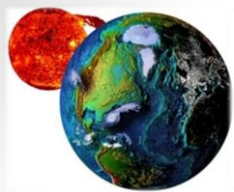
### Considerations:

- SWPC has no operational interests (-)
- Consistent with FY16 budget initiative (+)
- Addresses Dr. Sullivan's critical need (+)
- HEALER mission life is 15years (+)
- Impact on current STP workload (-)

### Division Chief Recommendations:

- Continue dialog with Mulligan
- Consider OSPO processing alternative
- Await outcome of coordination meeting
- Provide AAA on cost-reimbursable basis
- Submit "Request to Archive" paperwork

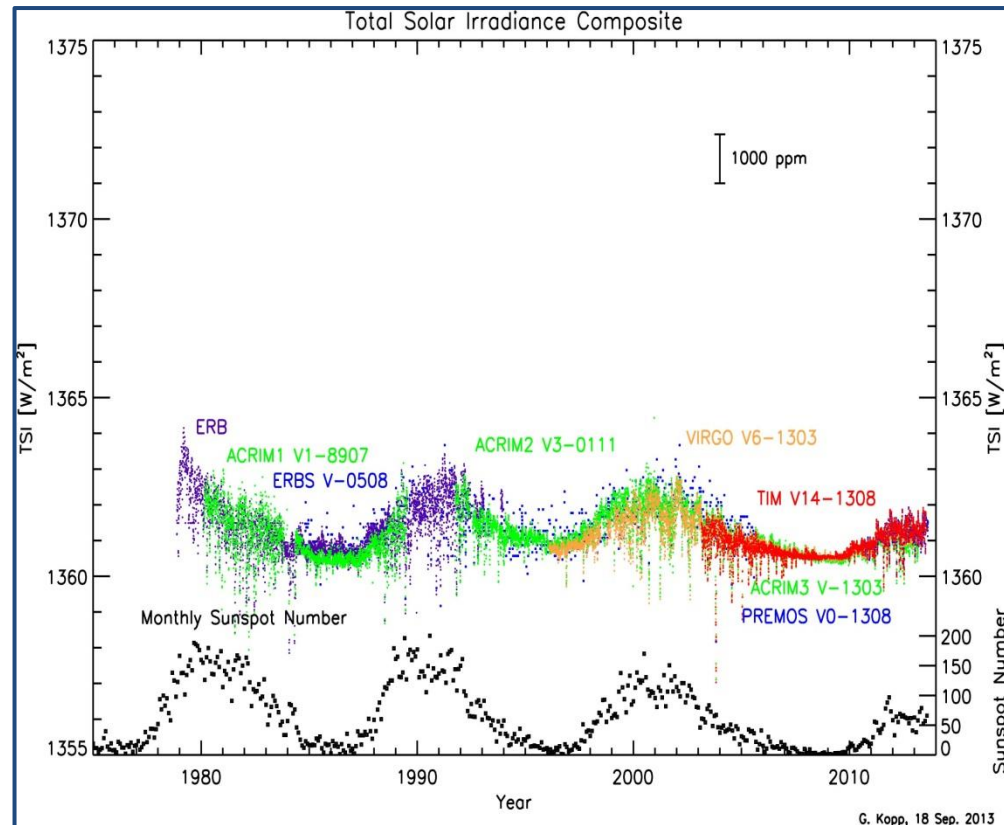


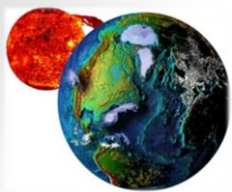


# Space Weather Team

## Info: TSI Calibration Transfer Experiment (TCTE)

TCTE was launched on the Air Force's STP-Sat3 on 19 Nov 2013 and put into a planned 500-km, 40-deg inclination orbit. After commissioning and outgassing, data acquisition started on 13-Dec with at least 1 orbit/day of solar observations. Overlapping Total Solar Monitor (TIM) measurements with SORCE were made in late December. Initial public data release will be in a couple of months.





# Space Weather Team

## Status: NSWP Implementation Plan

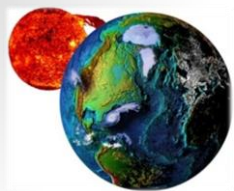
### *The National Space Weather Program*

*The Implementation Plan  
2<sup>nd</sup> Edition  
July 2000*

The Committee for Space Weather (CSW) will be updating the Implementation Plan (IP) for the National SWx Program (NSWP). The IP is a follow-on document to the [Strategic Plan](#) published in June 2010. Questions to address in the IP:

- What do we need to implement?
- What are the needed products?
- What are the research gaps?
- What are the observational gaps?
- What are needed models & what is the role for data assimilation?
- What is the plan for R2O?

The last [IP](#) was released in July 2000.

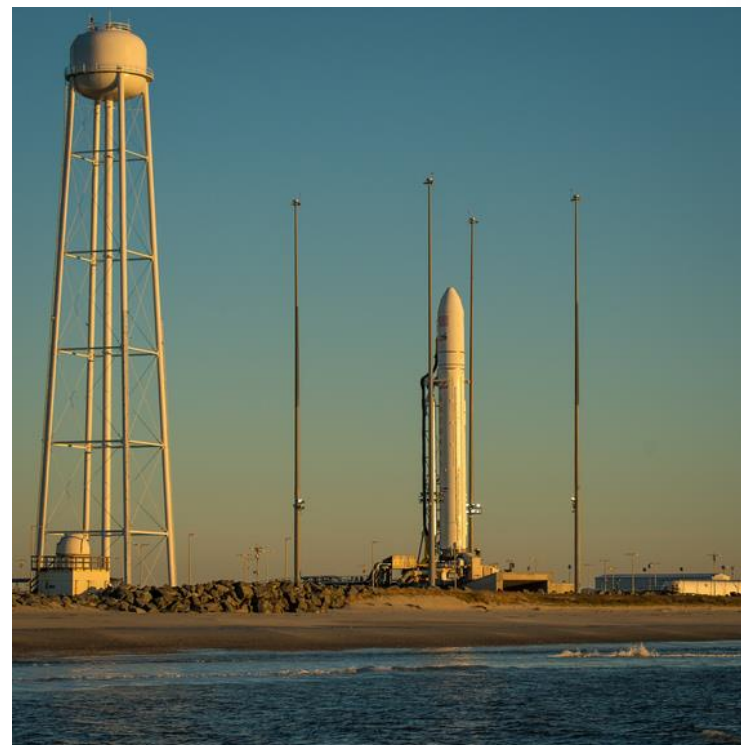
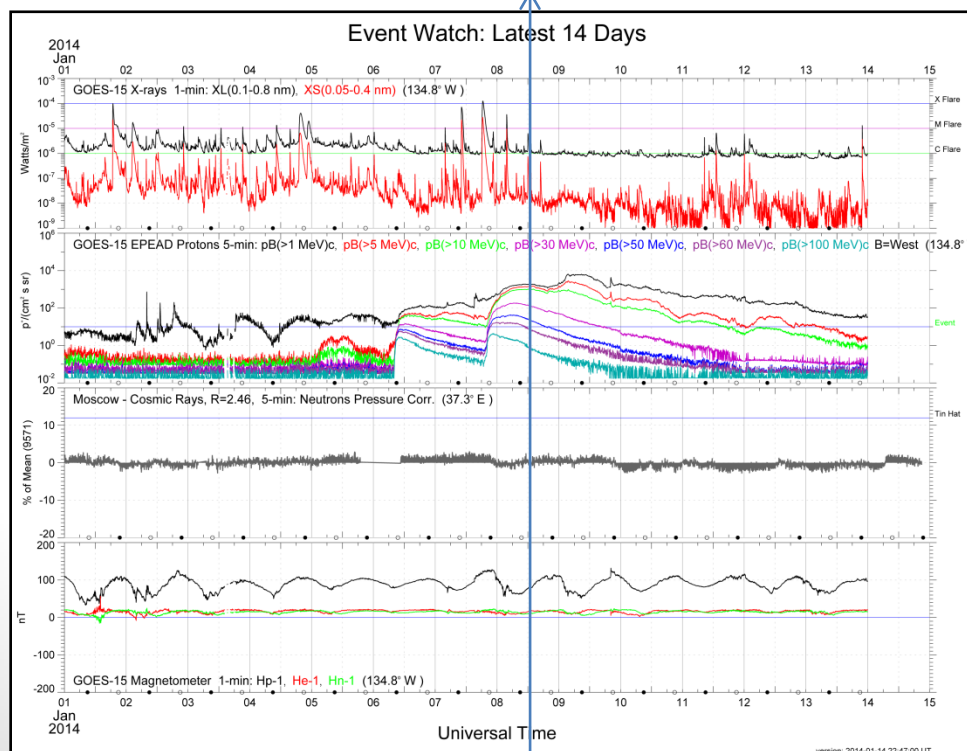


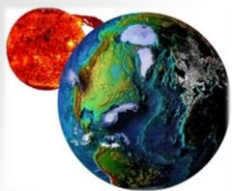
# Space Weather Team

## Info: Delayed Satellite Launch - SWx

Antares rocket is seen on launch during sunrise at NASA's Wallops Flight Facility on 08 Jan 2014 after its planned launch was delayed due to space radiation concerns from a huge solar flare. The largest solar event of the period was a X1 flare that occurred at 07/1832Z (Region 1944 @ S15W11). Relatedly, Juan Rodriguez notified SWPC that the forecast office erroneously issued an energetic electron event alert; Juan was subsequently requested to provide SWFO training materials.

### Scrub Launch



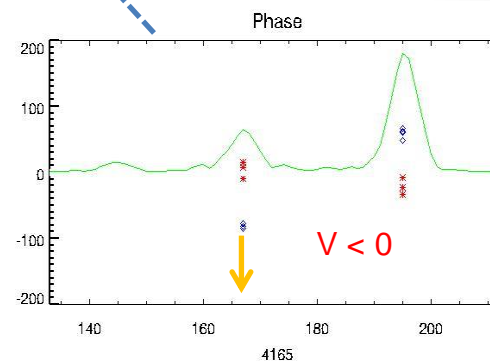
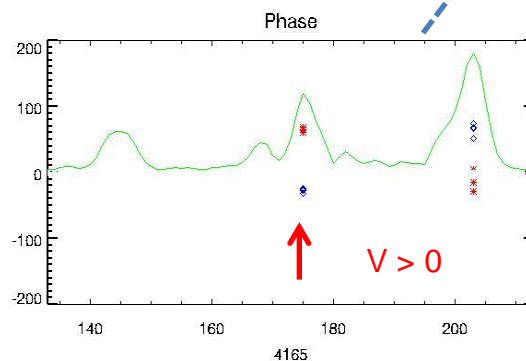
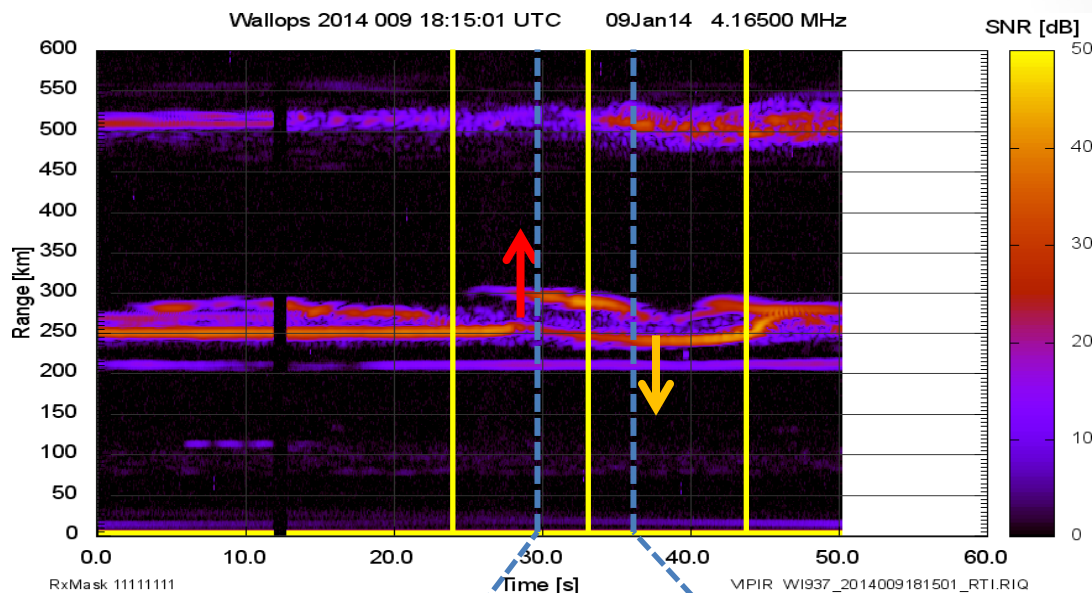


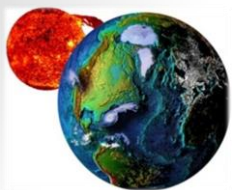
# Ionospheric Sounding Team

Accomplishment: . . and then on the next day

## Rocket launch observations of an ionospheric acoustic wave

- F1 region plasma displacements used to infer the presence of an ionospheric acoustic wave observed L+8 min
- Doppler measurements reveal the overhead upward and downward plasma motions
- Similar acoustic waves can be generated by earthquakes and volcanic eruptions

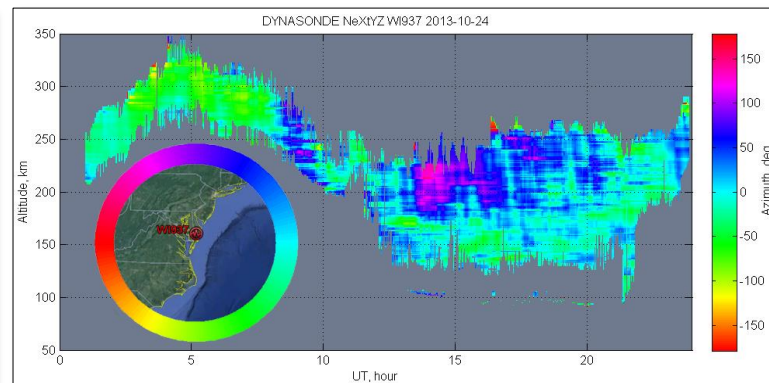
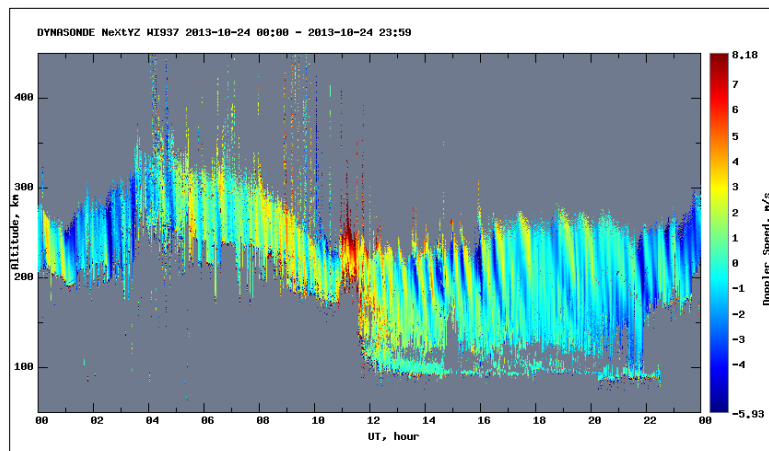
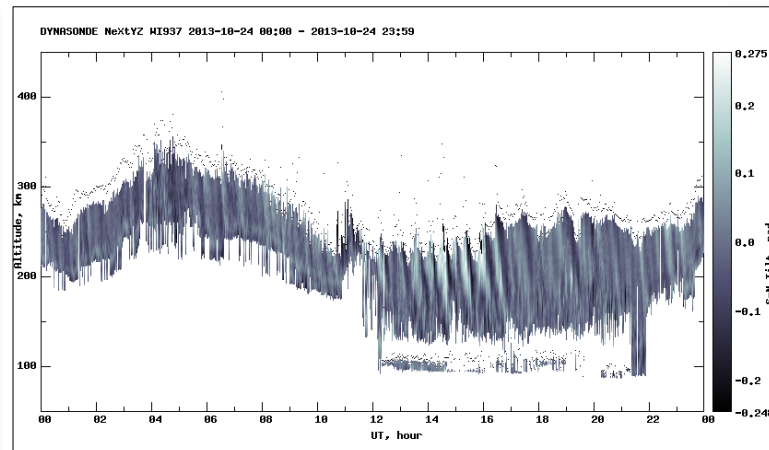
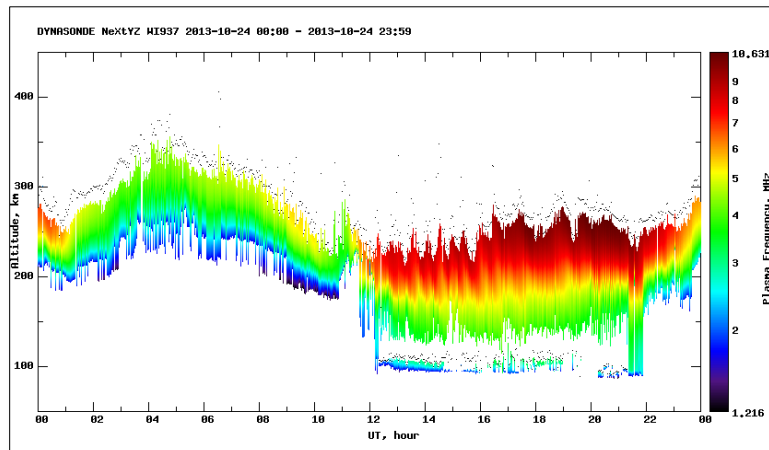




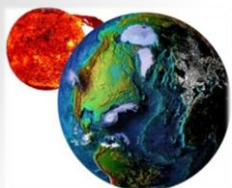
# Ionospheric Sounding Team

Info: Looking for the Source of AGW

Time series of Dynasonde NeXtYZ results: W1937 24 October 2013



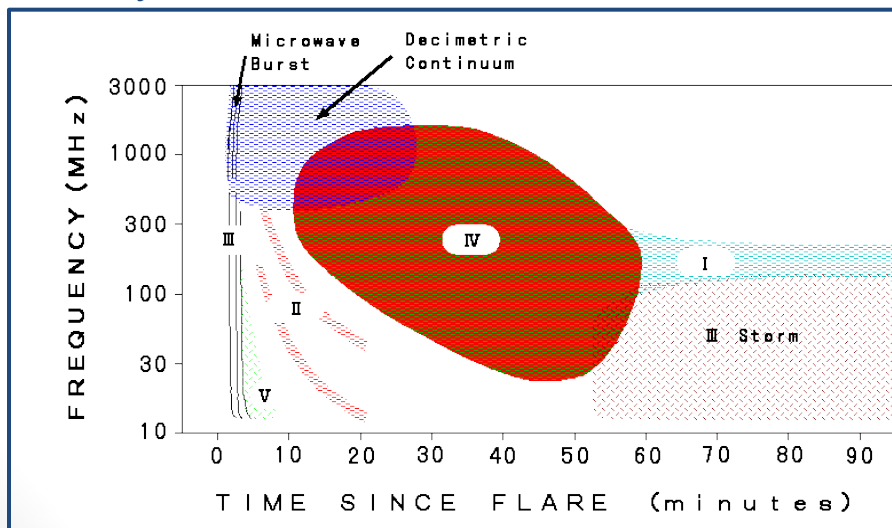
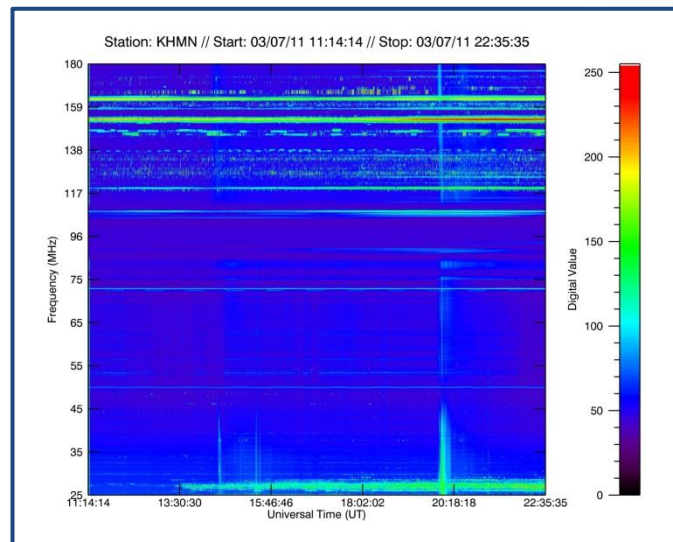
Directions of propagations of AGWs over  
Wallops Island, VA

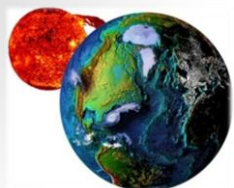


# WDS for Geophysics

## Achievement: Visualizing SRS Data

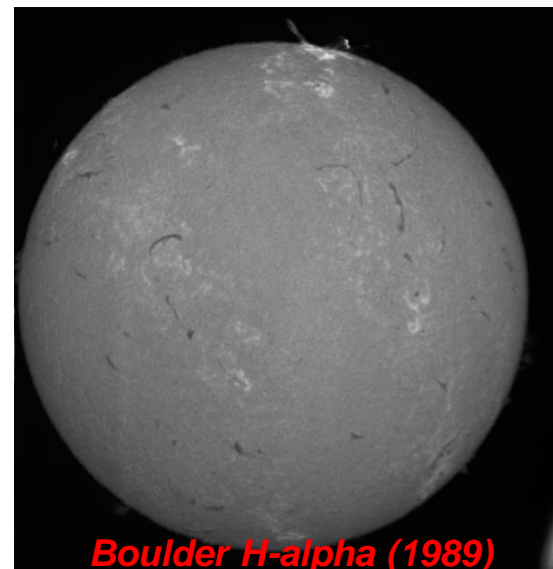
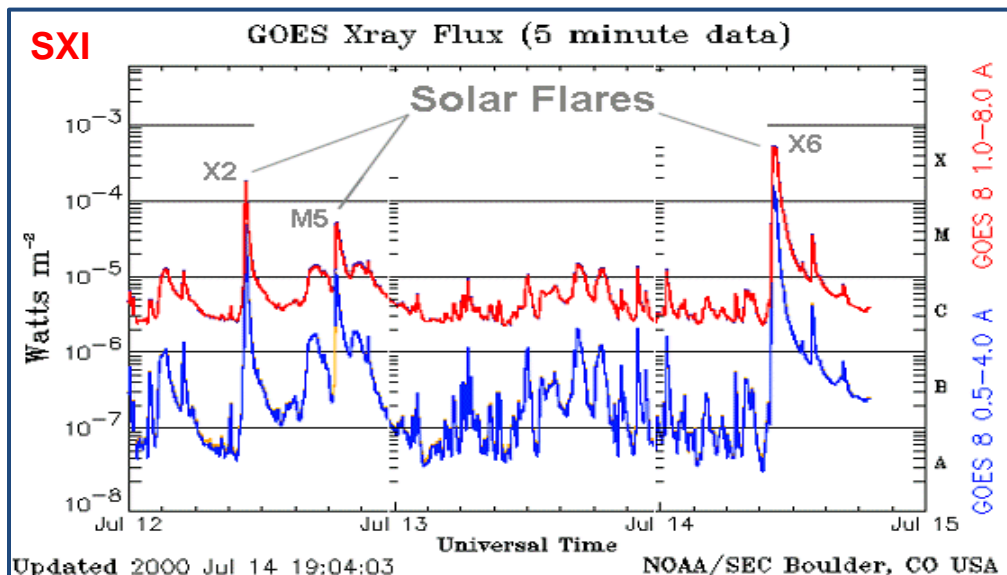
Solar radio bursts are monitored using the USAF Radio Solar Telescope Network (RSTN). NGDC archives over 55 station-years worth (2000-present) of solar radio burst data from the Solar Radio Spectrographs (SRS) at 5 worldwide sites. This visualization tool, developed in IDL, allows a user to create survey plots of daily SRS measurements.





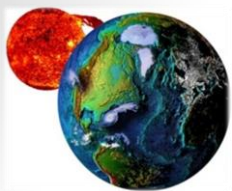
# WDS for Geophysics

## Achievement: X-ray Flare Metadata



X-ray Flare List with added metadata: [Link](#) (SXI no longer provides metadata)

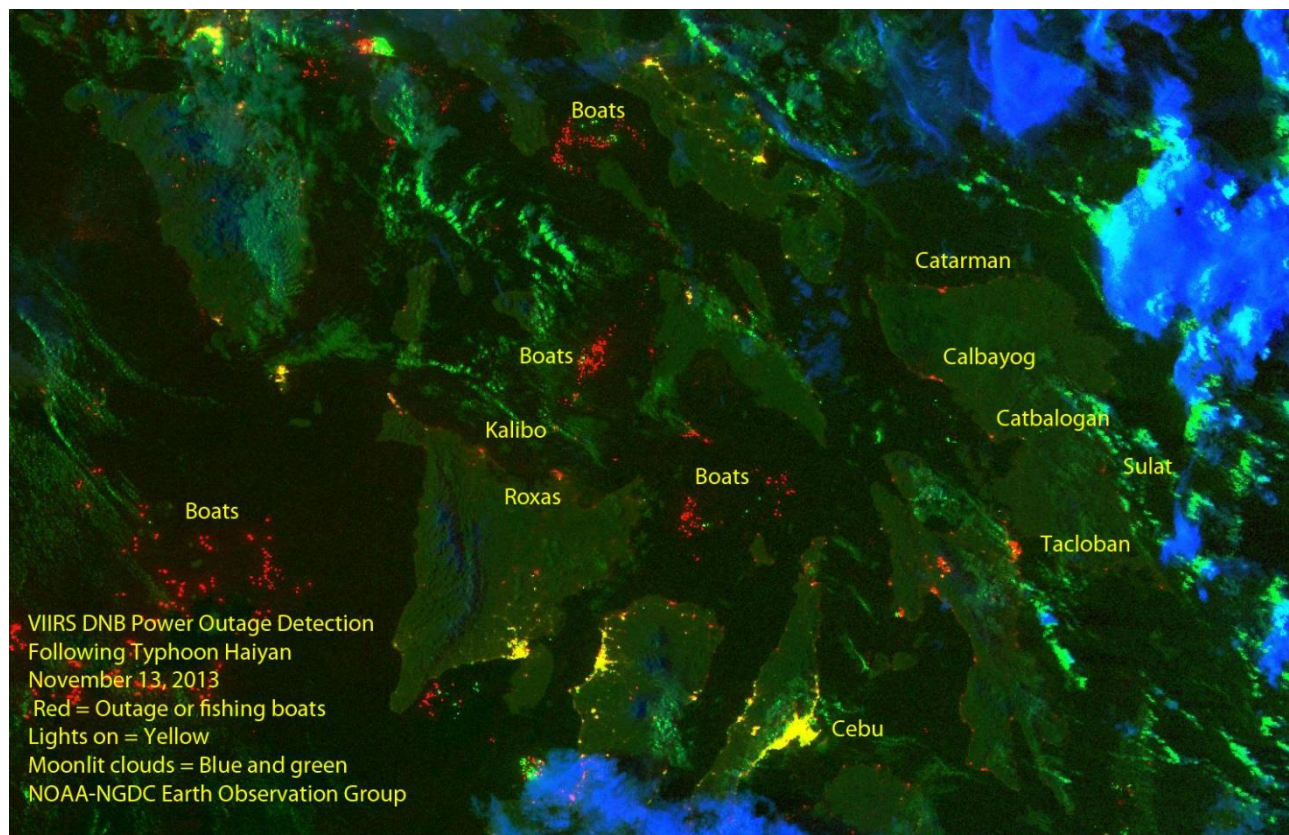
Date	Strt	Stop	Max	Location	Class	Sat	Energy Flux	NOAA Nmbr	Central Meridian Crossing
31777130131	2227	2241	2234		B 58	G15	3.6E-04		
31777130201	0334	0346	0342	N14E38	B 69	G15	3.1E-04	11665	130204.0
31777130201	1345	1354	1349	N14E33	B 36	G15	1.4E-04	11665	130204.0
31777130202	0502	0515	0511		C 12	G15	5.0E-04		
31777130202	0956	1003	1000		B 44	G15	1.1E-04		
31777130202	1948	2007	1958	N21E61	C 29	G15	2.2E-03	11667	130207.5
31777130203	0151	0203	0156	N22E55	B 69	G15	3.9E-04	11667	130207.3
31777130203	0216	0229	0224	N22E55	C 22	G15	1.1E-03	11667	130207.3
31777130203	0436	0504	0448	N23E53	B 93	G15	1.3E-03	11667	130207.2
31777130203	0556	0615	0610	N23E53	C 84	G15	3.3E-03	11667	130207.3
31777130203	0743	0853	0818	N23E53	C 15	G15	5.0E-03	11667	130207.4

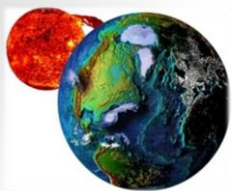


# Earth Observation Group

## Accomplishment: Typhoon Haiyan Power Outage

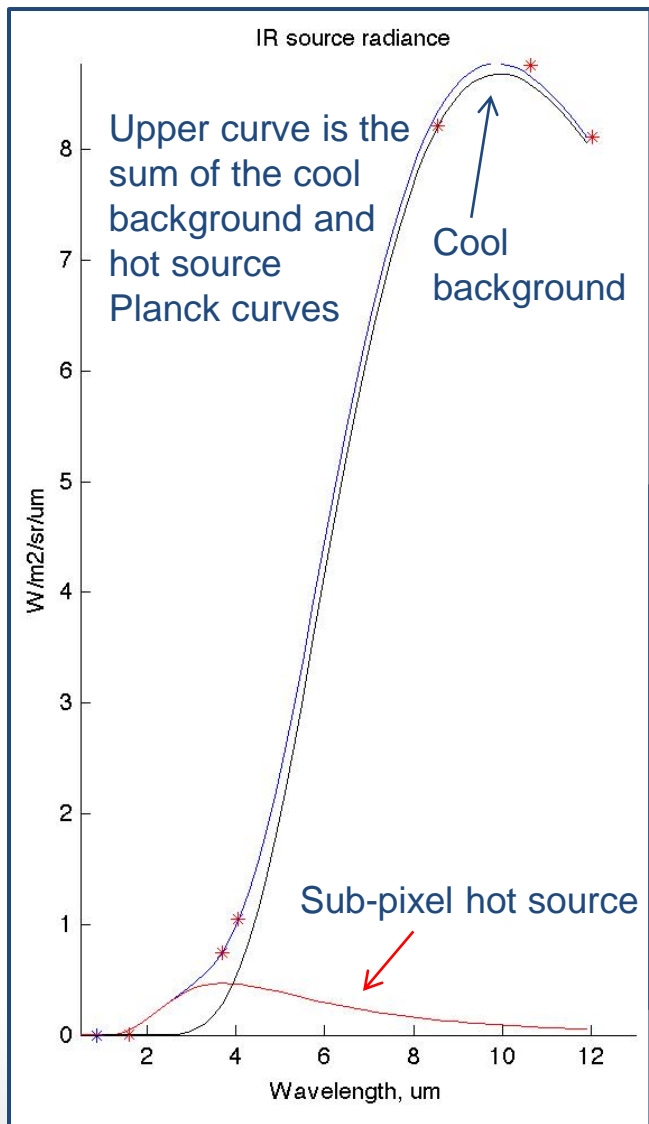
Super Typhoon Haiyan, the largest tropical cyclone ever recorded, struck the central Philippines on Thursday evening, November 7, (U.S. time) impacting the lives of over 25 million people. The Category 5 super storm harbored winds exceeding 200 mph along with torrential rain, causing massive destruction and loss of life (~6,000). The EOG used the VIIRS DNB to detect power outages in the aftermath of the storm.





# Earth Observation Group

## Accomplishment: Dual Planck Curve Fitting



A dual Planck curve fitting algorithm has been implemented in Nightfire<sup>1</sup>. Radiances in the long wave channels define the fit for the background. Radiances in the short-wave channels define the fit for the sub-pixel hot source. The result are estimates for the hot source temperature, source size and radiant heat.

### Combustion parameters:

Source ID=SVM10\_npp\_d20130619\_t1841057\_e1846461\_IR\_source\_555

Lat=1.765773 Lon=101.265160 deg.

Temperature=778 deg. K

Radiant heat intensity=7.99 W/m<sup>2</sup>

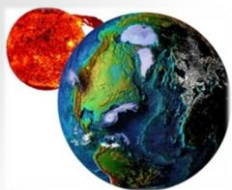
Radiant heat=4.88 MW

Source footprint=235.55 m<sup>2</sup>

Cloud situation=cloudy

Time=19-Jun-2013 18:46:38

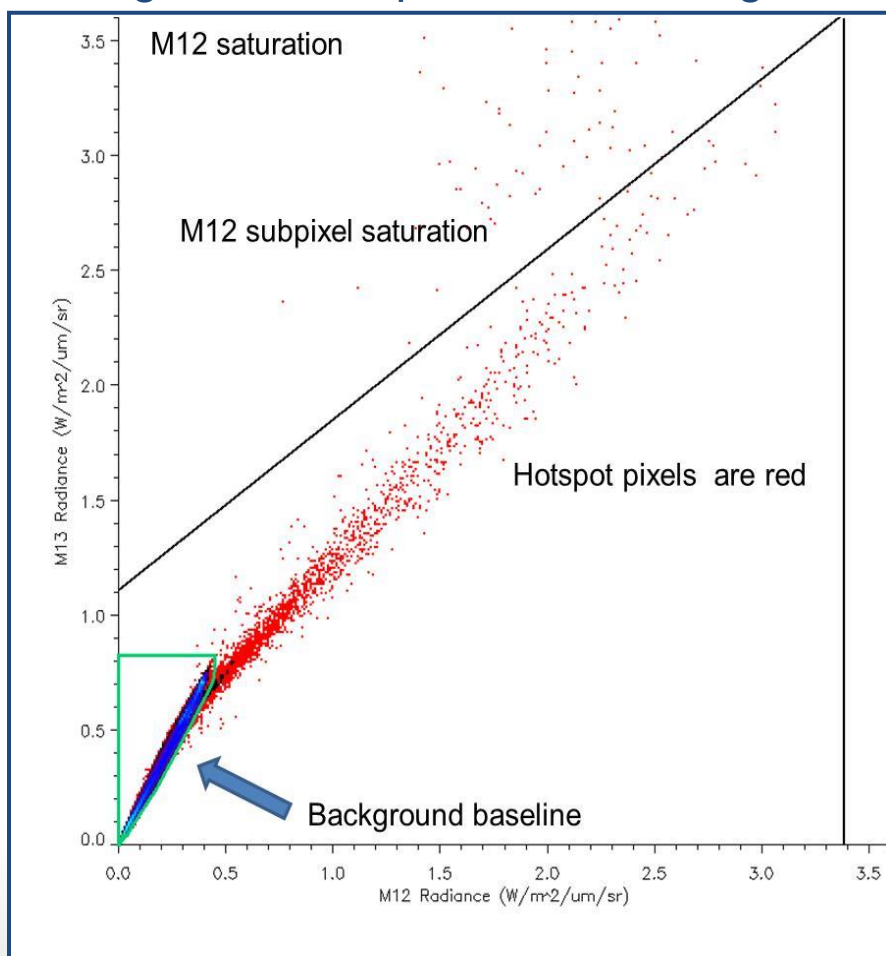
<sup>1</sup>The "Nightfire" algorithm detects and characterizes sub-pixel hot sources using multispectral data collected globally, each night, by the Suomi National Polar Partnership (NPP) Visible Infrared Imaging Radiometer Suite (VIIRS).



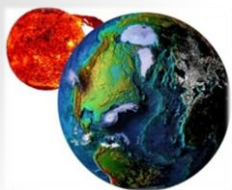
# Earth Observation Group

## Accomplishment: Exploiting VIIRS Capabilities

EOG has developed a new algorithm to detect VIIRS pixels containing combustion sources using the mid-wave infrared channels (M12 and M13). The algorithm complements the original M10 detection algorithm.



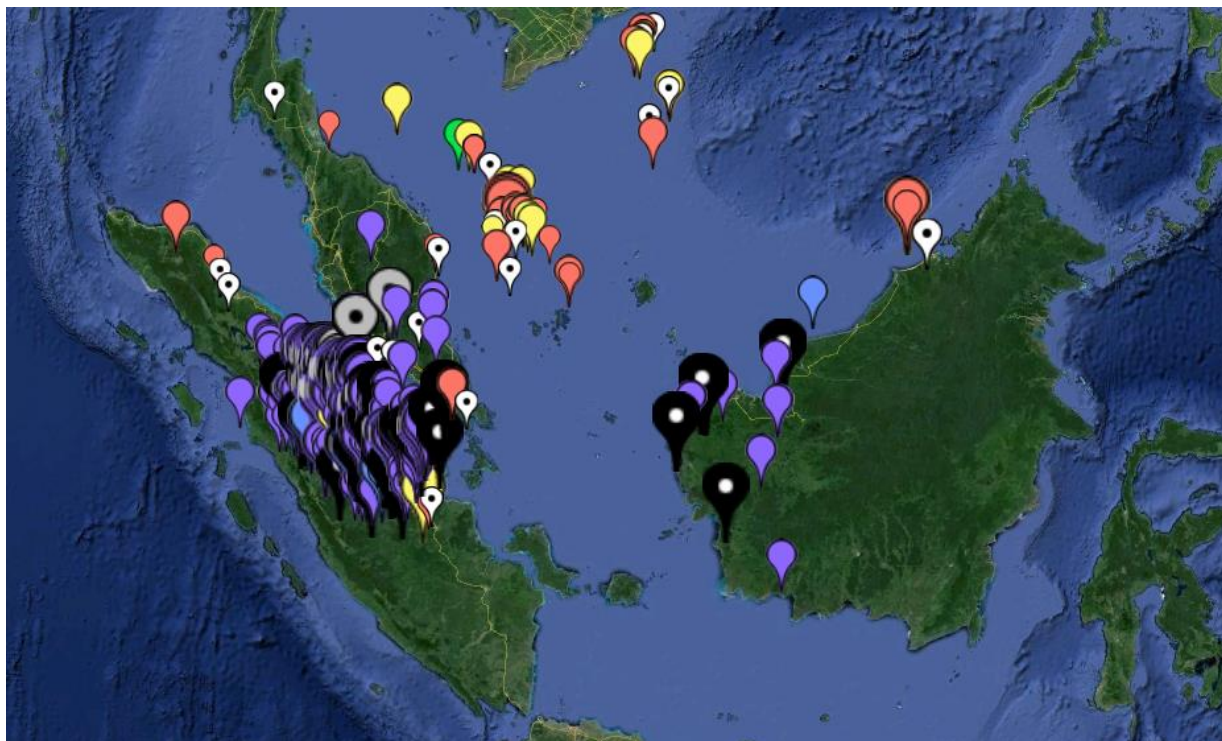
	Band No.	Driving EDR(s)	Spectral Range (um)	Horiz Sample Interval (km) (track x Scan)	
				Nadir	End of Scan
Reflective Bands	VisNIR	M1 Ocean Color Aerosol	0.402 - 0.422	0.742 x 0.259	1.60 x 1.58
		M2 Ocean Color Aerosol	0.436 - 0.454	0.742 x 0.259	1.60 x 1.58
		M3 Ocean Color Aerosol	0.478 - 0.498	0.742 x 0.259	1.60 x 1.58
		M4 Ocean Color Aerosol	0.545 - 0.565	0.742 x 0.259	1.60 x 1.58
		I1 Imagery EDR	0.600 - 0.680	0.371 x 0.387	0.80 x 0.789
		M5 Ocean Color Aerosol	0.662 - 0.682	0.742 x 0.259	1.60 x 1.58
		M6 Atmosph. Correct.	0.739 - 0.754	0.742 x 0.776	1.60 x 1.58
	SVMIR	I2 NDVI	0.846 - 0.885	0.371 x 0.387	0.80 x 0.789
		M7 Ocean Color Aerosol	0.846 - 0.885	0.742 x 0.259	1.60 x 1.58
		M8 Cloud Particle Size	1.230 - 1.250	0.742 x 0.776	1.60 x 1.58
		M9 Cirrus/Cloud Cover	1.371 - 1.386	0.742 x 0.776	1.60 x 1.58
		I3 Binary Snow Map	1.580 - 1.640	0.371 x 0.387	0.80 x 0.789
		M10 Snow Fraction	1.580 - 1.640	0.742 x 0.776	1.60 x 1.58
Emissive Bands	SVMIR	M11 Clouds	2.225 - 2.275	0.742 x 0.776	1.60 x 1.58
		I4 Imagery Clouds	3.550 - 3.930	0.371 x 0.387	0.80 x 0.789
		M12 SST	3.660 - 3.840	0.742 x 0.776	1.60 x 1.58
	LWIR	M13 Fires	3.973 - 4.128	0.742 x 0.259	1.60 x 1.58
		M14 Cloud Top Properties	8.400 - 8.700	0.742 x 0.776	1.60 x 1.58
		M15 SST	10.263 - 11.263	0.742 x 0.776	1.60 x 1.58
		I5 Cloud Imagery	10.500 - 12.400	0.371 x 0.387	0.80 x 0.789



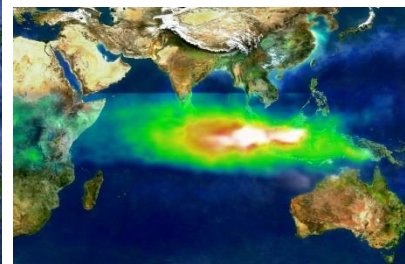
# Earth Observation Group

## New Task: Indonesia Peatland Fires

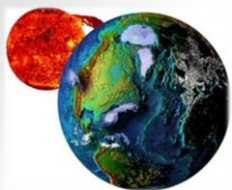
An EOG proposal to the Indonesia Climate Change Center was selected for funding from the U.S. State Department. The study focusses on improving the detection of peatland fires for modeling carbon and smoke emissions.



**VIIRS**



*"It is estimated that in 1997, peat and forest fires in Indonesia released between 0.81 and 2.57 Gt of carbon; equivalent to 13–40 percent of the amount released by global fossil fuel burning, and greater than the carbon uptake of the world's biosphere." (Wikipedia, 2014)*



# OUTLINE

## Solar & Terrestrial Physics Division

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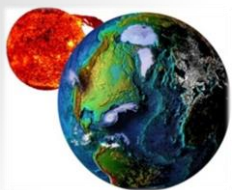
STP Division Overview

Milestones & Metrics

Accomplishments & Updates

➔ Professional Activities

Issues & Summary

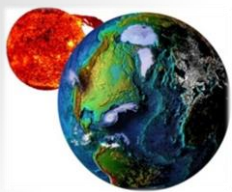


# Professional Activities

## STP YTD FY14 Publications – 11 (1 of 2)

### Publications (YTD):

- Ciliverd, M. A., N. Cobbett, C. J. Rodger, J. B. Brundell, M. H. Denton, D. P. Hartley, **J. V. Rodriguez**, D. Danskin, T. Raita, and E. L. Spanswick (2013), Energetic electron precipitation characteristics observed from Antarctica during a flux dropout event, *J. Geophys. Res. Space Physics*, 118, 6921–6935, doi:10.1002/2013JA019067. [**Peer reviewed**]
- Elvidge, C.D.** (2013), Space Based Surveillance Tools for Monitoring of Fisheries, Proceedings of the Asian Conference on Remote Sensing, Bali, India, 20-24 Oct 2013.
- Elvidge, C.D., K. Baugh, F-C Hsu and M. Zhizhin** (2013), SNPP Data Access of Agricultural Monitoring, Proceedings of the Asian Conference on Remote Sensing, Bali, India, 20-24 Oct 2013.
- Erwin, E.H., H.E. Coffey, W.F. Denig, D.M. Willis, R. Henwood and M.N. Wild** (2013), The Greenwich Photoheliographic Results (1874 – 1976): Initial Corrections to the Printed Publications, *Solar Physics*, 288, pp. 157-170, DOI 10.1007/s11207-013-0310-z [**Peer reviewed**]
- Hartley, D. P., M. H. Denton, **J. C. Green**, T. G. Onsager, **J. V. Rodriguez**, and H. J. Singer (2013), Case studies of the impact of high-speed solar wind streams on the electron radiation belt at geosynchronous orbit: Flux, magnetic field, and phase space density, *J. Geophys. Res. Space Physics*, 118, 6964–6979, doi:10.1002/2013JA018923. [**Peer reviewed**]
- Kress, B.T., **J.V. Rodriguez**, J.E. Mazur and M. Engel (2013), Modeling solar proton access to geostationary spacecraft with geomagnetic cutoffs, *Adv. Space Res.*, 52, 1939-1948, <http://dx.doi.org/10.1016/j.asr.2013.08.019>. [**Peer reviewed**]
- Rodriguez, J.V.**, J.C. Krosschell and J.C. Green, Intercalibration of GOES 8-15 solar proton detectors, Accepted, DOI: 10.1002/2013SW000996 [**Peer reviewed**]
- Snow, M., M. Weber, **J. Machol**, R. Viereck and E. Richard (2014) Comparison of Magnesium II Core-to-Wing Ratio Observations During Solar Minimum 23/24, *J. Space Weather Space Clim.*, 4, A04, doi:10.1051/swsc/2014001. [**Peer reviewed**]



# Professional Activities

## STP YTD FY14 Publications – 11 (2 of 2)

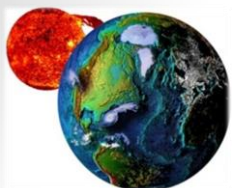
### Publications (continued):

Soloviev, A., A. Khokhlov, E. Jalkovsky, A. Berezhko, A. Lebedev, E. Kharin, I. Shestolaply, M. Mande, V. Kuznetsov, T. Bondar, **J. Mabie**, M. Nisilevich, V. Nechitailenko, A. Rybkina, O. Pyatygina and A. Shibaev (2013), The Atlas of the Earth's Magnetic Field, eds. A. Gvishiani, A. Frolov and V. Lapshin, Publ. GC RAS, Moscow, 361 p. doi:10.2205/2013/BS011\_Atlas\_MPZ

Willis, D.M., **H.E. Coffey**, R. Henwood, **E.H. Erwin**, D.V. Hoyt, M.N. Wild and **W.F. Denig** (2013), The Greenwich Photo-heliographic Results (1874 – 1976): Summary of the Observations, Applications, Datasets, Definitions and Errors, *Solar Physics*, 288, pp. 117-139, DOI 10.1007/s11207-013-0311-y. [**Peer reviewed**]

Willis, D.M., R. Henwood, M.N. Wild, **H.E. Coffey**, **W.F. Denig**, **E.H. Erwin** and D.V. Hoyt (2013), The Greenwich Photo-heliographic Results (1874 – 1976): Procedures for Checking and Correcting the Sunspot Digital Datasets, *Solar Physics*, 288, pp. 141-156, DOI 10.1007/s11207-013-0312-x. [**Peer reviewed**]

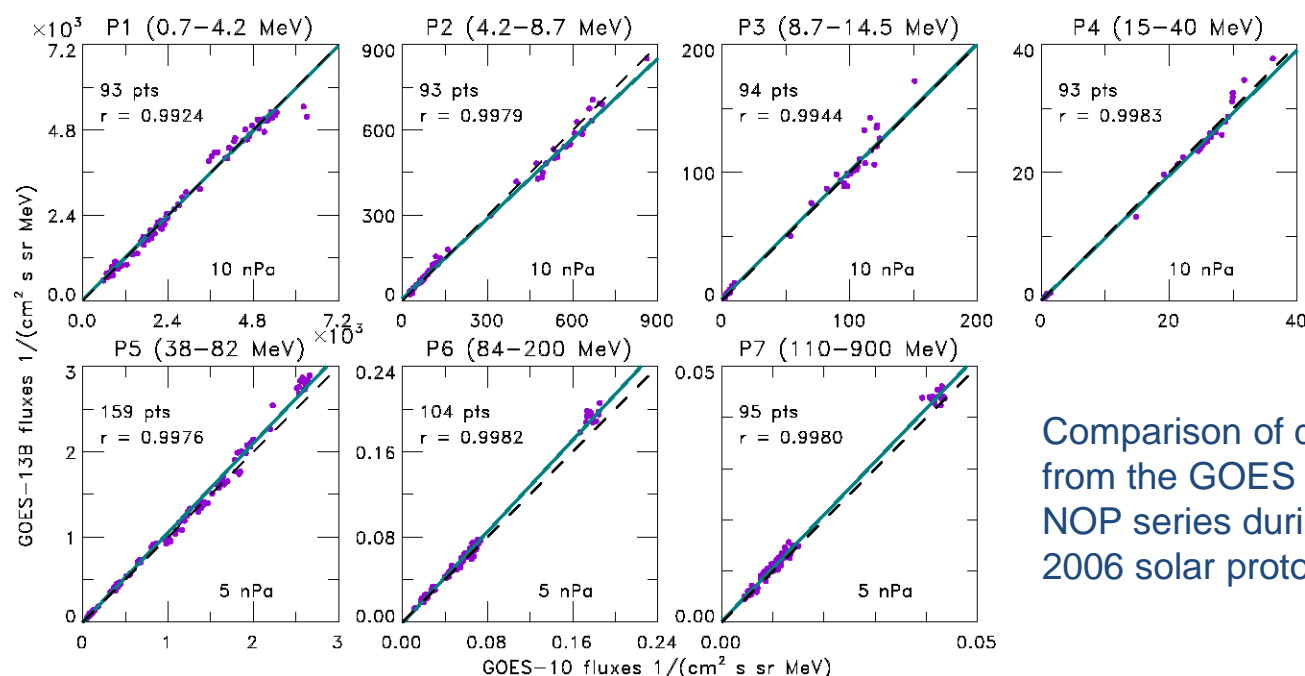
Total accepted or published: 11  
**Peer Reviewed: 8**



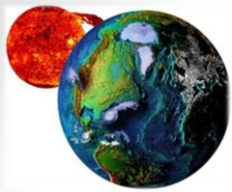
# Professional Activities

## Featured Publication

Rodriguez, J.V., J.C. Krosschell and J.C. Green, **Intercalibration of GOES 8-15 solar proton detectors**, Accepted, *Space Weather*, DOI: 10.1002/2013SW000996.



- Geosynchronous solar protons may be inter-calibrated with low scatter when the solar wind dynamic pressure > 5-10 nPa
- Responses of GOES 8-15 solar proton channels agree to within  $\pm 20\%$
- Impact on GOES integral fluxes used for real-time alerts is <10%



# OUTLINE

## Solar & Terrestrial Physics Division

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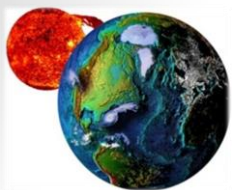
STP Division Overview

Milestones & Metrics

Accomplishments & Updates

Professional Activities

➔ Issues & Summary



# Issues & Summary

## Solar & Terrestrial Physics Division

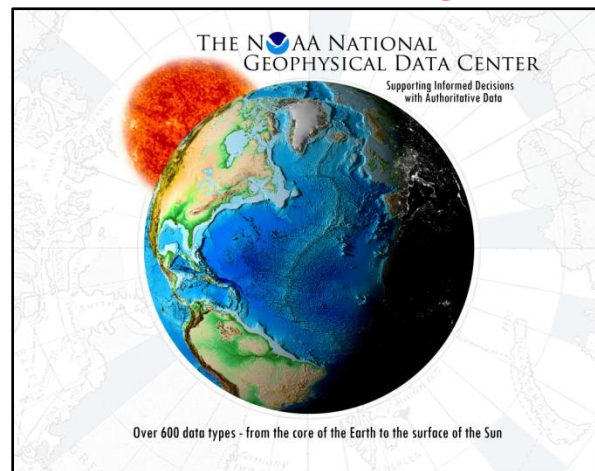
- ✓ NGS Aerial Photography (4QFY13) – **Awaiting NGS interactions**
- ✓ GOES-R SWx Algorithm Risks (4QFY13) – **Improving**
- ✓ Federal travel restrictions limit program growth (4QFY12) – **NLAI**
- ✓ Fed hiring restrictions having mission impact (3QFY12) – **Critical**
- ✓ GOES-R L2+ SWx algorithms (3QFY11) – **No change**
  - Frozen Baseline / Algorithm Readiness – Waivers – **Improving**
  - GOES L0 Data Not in CLASS – **Improving**
  - GOES-R Data Management Tasks – GOES-R Feds – **No change**

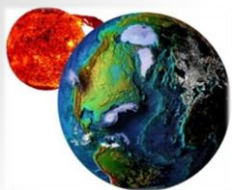
### Metrics

Papers (FY14-YTD): 11

✓ Peer Reviewed: 8

Presentations (FY14-YTD): 25





# QUESTIONS?

